92-00007/

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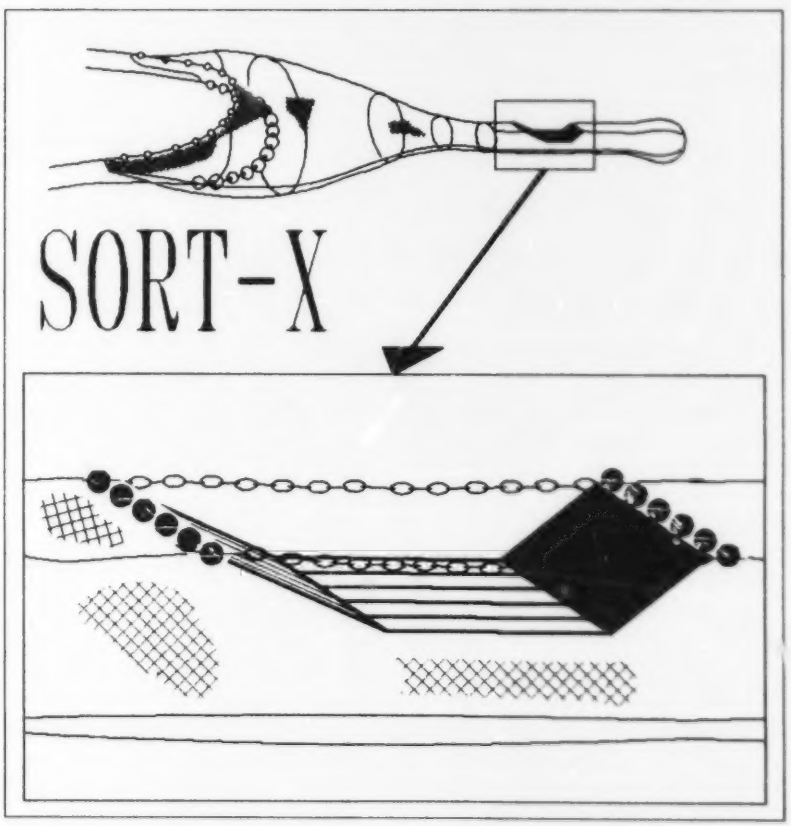
PROJECT SUMMARY

Newfoundland Region

No. 27, March, 1991

DEVELOPMENT OF IMPROVED SIZE SORTING TECHNOLOGY IN OTTER TRAWLS



Fisheries and Oceans Pêches et Océans

Canada

PURPOSE

This experiment was conducted to determine if the SORT-X system incorporated into the otter trawl could significantly reduce the capture of immature and/or small codfish.

GENERAL INFORMATION

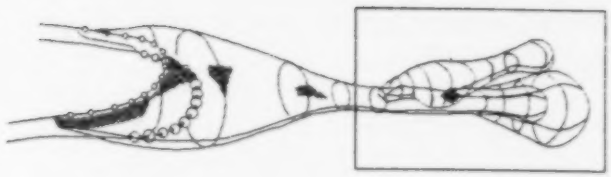
Recent quota reductions in some Newfoundland fish stocks, especially the northern cod stock, has led to an ever increasing need to identify methods to better conserve and enhance the viability of the stocks to their fullest potential. One way to accomplish this would be to ensure that the juveniles of the species have a better chance to survive the commercial fishery and grow to a size that would provide a better rate of return.

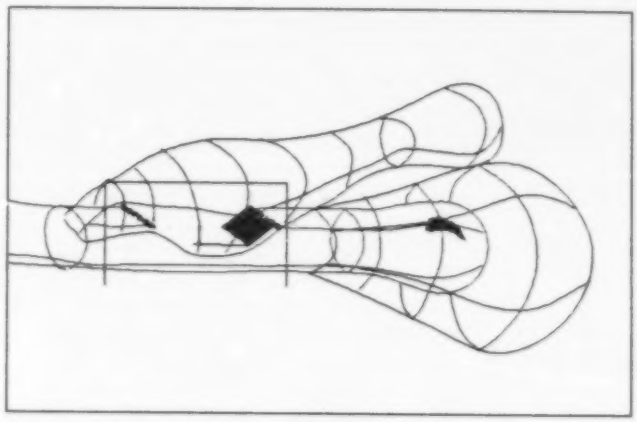
In keeping with Recommendation 3 of the Harris Panel Report, the Fisheries Development Division of the Fisheries and Habitat Management Branch, Department of Fisheries and Oceans, conducted experiments using the SORT-X system onboard the stern trawler F.V. Zandvoort during a cod directed trip to NAFO area 3K during the period February 11 - 20, 1991. The Recommendation in question calls for immediate investigation into the selectivity of various fishing gear types with the intent of improving the yield in the fishery by eliminating the harvest of two, three, four, and five year old fish, and to reduce the by-catch of these year classes. Also participating in the experimental project were D.F.O's Science Branch and Fishery Products International (F.P.I.).

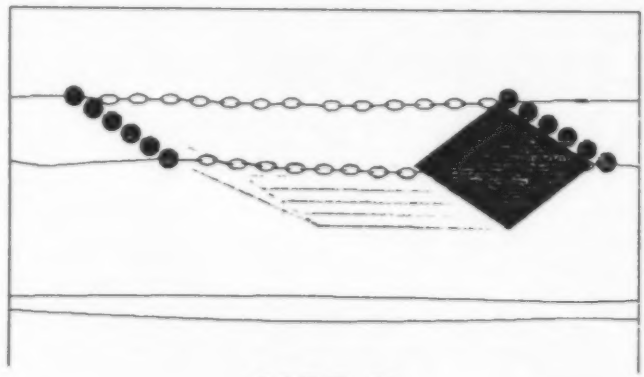
During the last decade, considerable work on mesh size selectivity and shape has been carried out in Canada and Europe in an effort to achieve sharper selection and a reduced capture of juvenile fish. Despite increases in the minimum mesh size and the use of square mesh cod ends (by F.P.I.) during the northern cod fishery, cod fish trawls are still capable of catching fairly high percentages of small/juvenile fish.

SYSTEM DESCRIPTION

The SORT-X system was developed in Norway and has shown promising results during initial testing. The system is very simple and uses grids to sort fish entering the otter trawl. The system is placed in the forepart of the extension piece and permits undersized fish to escape rapidly from the trawl without wriggling through tight meshes.







SORT-X

PROJECT EXPERIMENTATION

Experiments were conducted by D.F.O. personnel using the SORT-X to determine if the system was a workable alternative to mesh size increases. All fish entering the otter trawl were captured in order to determine the population size composition, and random samples were taken from "successful sets" (Ie. those with no problems encountered - such as net damage, etc.) from the various sections of the trawl. These sections included the SORT-X, the codend and codend cover. To determine the size composition of escaping fish, a 49mm net was utilized to catch fish from the SORT-X and codend (Ie. cover).

RESULTS

Of 22 sets made by the Zandvoort, 10 were successful in that measurements were made of random samples of fish during the entire processing time and were thus representative of the entire catch. Weights were determined by applying D.F.O. length/weight conversion tables to sample lengths of unculled catch discards and processed fish (see Results Table 1). In certain instances the codend and codend cover had to be combined because of small tears which occurred in the codend.

Two sizes of grids (50mm and 55 mm) were to be tested during this trip. However, only the 50mm grid was tested due to the fact that results indicated that this would be large enough to select out the smaller fish and that a section of the 55mm grid had to be used to replace the system's aluminum frame which was damaged.

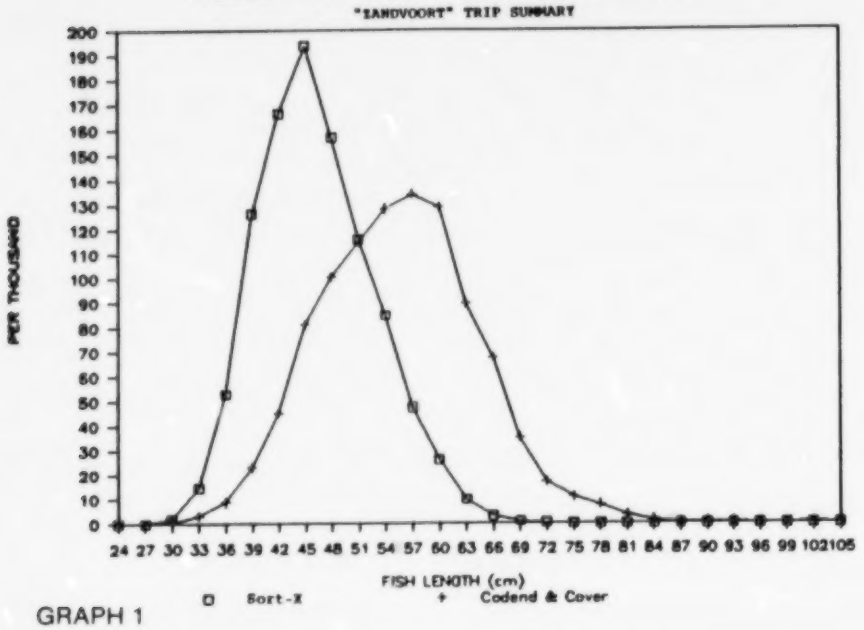
The concentrations of fish were more than the SORT-X could handle and since it was unable to determine the amount of catch, (Ie. Simrad system could not be used) optimim results could not be achieved. However, indications are that the SORT-X system, with a few modifications and more testing, could be a valuable asset to both the Department of Fisheries and Oceans and industry in the selective release of small fish.

TABLE 1 - RESULTS OF SORT-X EXPERIMENT ON A SET BY SET BASIS

SET #	SECTION	# FISH	LENGTH RANGE (CM)	AVERAGE LENGTH/FISH (CM)	TOTAL WEIGHT (KG)	AVERAGE WEIGHT/FISH (KG)
1	Sort-X	992	30-68	44.67	813.41	0.82
	Codend cover	454	27-53	39.15	239.53	0.53
	Codend	5175	33-95	49.03	6089.84	1.18
4	Sort-X	653	30-68	48.31	665.23	1.02
	Codend cover	392	24-65	45.14	325.05	0.83
	Codend	9531	36-98	57.37	16859.84	1.77
5	Sort-X	769	33-71	46.76	717.93	0.93
	Codend cover	274	33-65	45.44	231.66	0.85
	Codend	6787	36-80	52.40	9215.16	1.34
8	Sort-X	1383	33-71	44.96	1116.60	0.81
	Codend cover	215	33-65	45.71	198.94	0.93
	Codend	1559	33-86	55.24	2463.16	1.58
11	Sort-X	627	36-65	49.76	705.21	1.12
	Codend cover	360	39-68	49.80	499.20	1.39
	Codend	11687	42-95	58.94	22334.80	1.91
14	Sort-X	194	33-68	48.80	212.78	1.10
	Codend cover	221	33-65	47.28	209.23	0.95
	Codend	360	36-80	56.21	556.60	1.55
15	Sort-X	971	33-68	50.50	1130.59	1.16
	Codend cover & Codend	20233	39-89	58.23	37338.00	1.85
17	Sort-X	375	30-65	45.56	292.37	0.78
	Codend cover	976	30-65	45.87	850.40	0.87
	Codend	591	30-83	55.28	929.88	1.57
18	Sort-X	139	30-74	51.27	174.65	1.26
	Codend cover & Codend	2080	39-86	62.15	4721.75	2.27
19	Sort-X	614	36-65	49.30	672.68	1.10
	Codend cover	644	30-71	49.16	638.52	0.99
	Codend	11475	30-104	51.92	20472.96	1.78

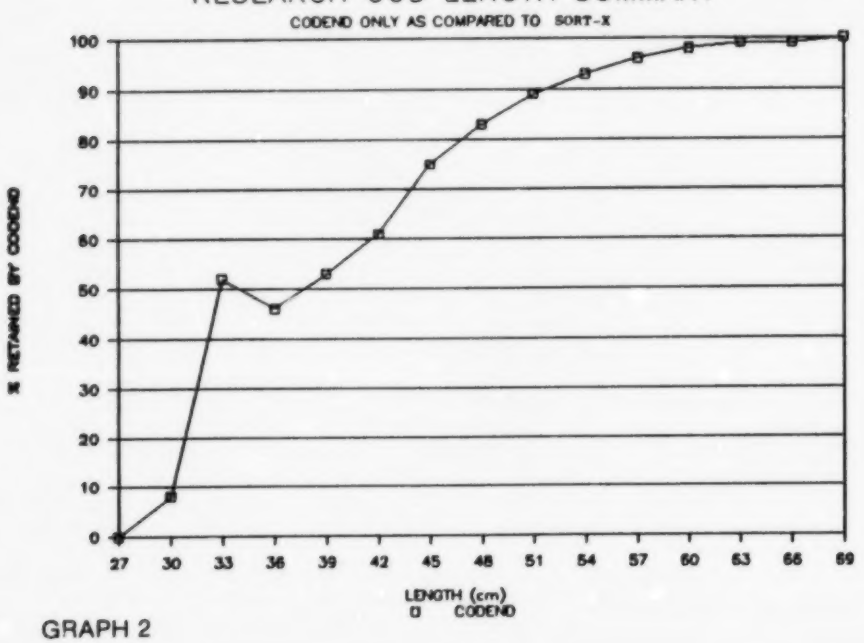
NOTE: In sets 15 and 18 the codend cover and codend were combined due to escapement via small amounts of damage in the codend.

RESEARCH COD LENGTH SUMMARY



GRAPH 1

RESEARCH COD LENGTH SUMMARY



GRAPH 2

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